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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,335	09/29/2005	Peter Bain	9052-228	4628
20792 7590 04/28/2010 MYERS BIGEL SIBLEY & SAJOVEC PO BOX 37428 RALEIGH, NC 27627			EXAMINER OSELE, MARK A	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,335	Applicant(s) BAIN ET AL.	
	Examiner Mark A. Osele	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29, 32-38, 40 and 42-45 is/are pending in the application.
 4a) Of the above claim(s) 32-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-21, 25-29, 38, 40, 42-43 is/are rejected.
- 7) ☐ Claim(s) 14, 22-24, 44 and 45 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13, 15, 19-21, 26-29, `38, 40, and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al. (U.S. Patent Publication 2004/0014860) in view of Aizawa et al. (U.S. Patent 5,609,954) and WIPO Publication WO 00/75254 (Bain et al.).

Meier et al. shows that it is known to apply windshields to vehicles using an adhesive comprising microspheres surrounding a curing agent wherein the microspheres are destroyed by the application of heat thereby releasing the curing agent and curing the adhesive for bonding (paragraphs 0003-0004). Aizawa et al. teaches that adhesive comprising microspheres surrounding a blowing agent wherein the microspheres are destroyed by the application of heat thereby releasing the blowing agent and separating the adhered components. Bain et al. teaches a method of bonding and debonding two or more surfaces of an adhesive system, the system comprising: (i) an adhesive composition at its bonded surface, the composition placed between the surfaces, and the adhesive composition comprising an adhesive agent and/or a primer at its interface and dispersed therein at least two sets of thermoexpandable microspheres that are not simultaneously activatable; (ii) a first set of

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microspheres being associated with curing; and (iii) a second set of microspheres associated with debonding (Page 5, lines 7-10; Page 6, lines 16-24), wherein in order to debond the system a sufficient power level of thermal radiation and/or thermal energy is provided (Page 7, lines 12-13) which concentrates on the adhesive surfaces so as to expand the second set of microspheres in the adhesive and so causes weakening of adhesive surface forces at the interface of the layers in the adhesive system (Page 8, lines 4-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to employ two sets of microspheres in the adhesive system of Meier et al. because Aizawa et al. shows that microspheres can include a blowing agent which aids in separation of a laminate and it is well known that windshields are commonly removed for repair or during recycling of the automobile. Furthermore, Bain et al. teaches that two sets of microspheres can reside in the same adhesive without being simultaneously activatable so that the microspheres of Meier et al. can be destroyed during bonding to release the curing agent and the microspheres of Aizawa et al. can be activated later to release the blowing agent for delamination.

Regarding claim 2, Bain et al. shows the contents of the microspheres leaches or migrates through their porous shells (Page 6, lines 16-21).

Regarding claim 3, Bain et al. the microspheres encapsulate a blowing agent (Page 5, lines 18-20; Page 6, lines 12-14). Aizawa et al. also shows the microspheres to encapsulate a blowing agent (column 3, line 66 to column 4, line 2).

Regarding claim 4, Bain et al. shows a first power level of thermal energy expands the first set of microspheres so the contents can leach or migrate through their

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porous shells and a second, higher power level of thermal radiation expands the second set of microspheres to cause weakening of adhesive surface forces in the interface of the adhesive composition (Page 6, lines 12-24; Page 7, lines 15-17; Page 8, lines 1-2).

Regarding claim 5, Bain et al. shows the debonding step is performed months or years after the bonding step when the windshield or shower wall has been damaged or worn (Page 2, lines 5-7).

Regarding claims 6-7, Bain et al. teaches that two sets of microspheres (or microcapsules) in the adhesive can encapsulate a variety of different agents. Bain et al. further teaches that their activation is a result of specified applied conditions such that a first set of microspheres can have released their contents (such as a curing agent or catalyst) while a second set of intact microspheres (such as containing an expanding agent) can be present at the same time (Page 6, lines 16-31). Bain et al. also teaches that the microsphere activation temperature is dependent upon the environment in which the product is being used (Page 7, line 19 to Page 8, line 2) and that two different temperatures for activating the two sets of microspheres is preferable (Page 7, lines 15-17). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a first activating temperature for the set of microspheres containing a catalyst and a second, significantly higher, activating temperature for the expanding microspheres because Bain et al. teaches that the two sets of microspheres can have different activating temperatures to allow the two encapsulated agents to perform their functions separately. Bain et al. teaches that the exact activation temperatures are a result effective variable, therefore, it would have been obvious to one of ordinary skill in

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the art at the time of the invention to determine the two activation temperatures by routine optimization. Further regarding claim 6, co-polymeric shells are well known and conventional for microspheres. Further regarding claim 7, Bain et al. shows the expanding agent to be selected from the group comprising a sublimation agent, water, or an explosive agent (Page 6, lines 12-14).

Regarding claim 8, Bain et al. shows the two sets of microspheres can have different diameters (Page 7, lines 15-17).

Regarding claims 9-10, Meier et al. shows the adhesive to have a curing activator activated by an applied thermal energy.

Regarding claim 11, Bain et al. shows the adhesive is polyurethane or an MS polymer (Page 5, lines 22-23).

Regarding claim 12, Bain et al. shows the microspheres are activated in a temperature range of about 45 to 220°C (Page 7, line 27 to Page 8, line 1).

Regarding claim 13, Bain et al. teaches that the exact activation temperatures are a result effective variable, therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the two activation temperatures by routine optimization

Regarding claim 15, Bain et al. shows the adhesive to have microspheres in the range of 1-30% by volume (Page 7, lines 9-10). One of ordinary skill in the art would have realized that the lower end of the disclosed range would be expected to correlate to 2-3% by weight.

Regarding claim 19, Bain et al. shows the composition further comprises a black coloring agent which would coat the microspheres (Page 6, lines 4-6).

Regarding claim 20, Meier et al. teaches the use of an adhesive with paramagnetic or ferromagnetic nanoparticles inside microspheres wherein the nanoparticles are signal receivers for electromagnetic energy to heat the adhesive and cause the microspheres to swell and/or rupture (paragraphs 0007, 0013, 0017). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the nanoparticles of Meier et al. into the the microspheres of Bain et al. because Meier et al. shows these nanoparticles to create localized heating of the adhesive without undue heating of the substrates to be bonded (paragraph 0018).

Regarding claim 21, the microspheres act as a carrier.

Regarding claim 26, the microspheres are attached to a contact surface of one of the components which it is desired to attach.

Regarding claim 27, Bain et al. shows the adhesive composition is provided substantially around the periphery of one or both of the contact surface of the items to be attached to one another.

Regarding claim 28, the depth and breadth or thickness and wideness of the adhesive would either be uniform or vary.

Regarding claim 38, the surfaces being debonded are a vehicle panel and vehicle glazing, the microspheres have a diameter between 10 and 50 μm and the activation temperature range is between 110 and 210°C (Page 7, lines 5-12).

Regarding claim 40, Bain et al. teaches that the exact activation temperatures are a result effective variable, therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine the two activation temperatures by routine optimization

Regarding claim 42, Bain et al. shows the instantly claimed limitations but fails to show the vehicle glazing or panel to be removed in an end of vehicle life process. It is conventional to remove glass from metal when reclaiming a vehicle at the end of its life so the metal and glass can be recycled separately. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Bain et al. in an end of vehicle life process because at this stage it is important to remove glazings from the vehicle for recycling.

Regarding claim 43, the thermoexpandable microspheres increase in volume to become a pressure activator so as to debond the interfaces of the adhesion system (Page 8, lines 4-12).

3. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al. in view of Aizawa et al. and WIPO Publication WO 00/75254 (Bain et al.) as applied to claim 1 above and further in view of Gilleo (U. S. Patent 6,936,644). Gilleo shows a method of adhesive bonding wherein the adhesive comprises a set of microspheres being associated with curing and bonding and the microspheres release their contents by exposure to infrared energy (column 1, lines 7-12; column 2, lines 50-67). It would have been obvious to one of ordinary skill in the art at the time of the

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invention to use infrared radiation for applying the thermal radiation to the microspheres of the references as combined because Gilleo shows infrared radiation to be effective in releasing the contents of microspheres in an adhesive composition.

Regarding claim 17, Gilleo further shows the infrared radiation to have a wavelength between about 700 and 12,000 nm.

4. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al. in view of Aizawa et al. and WIPO Publication WO 00/75254 (Bain et al.) as applied to claim 1 above and further in view of Bennett et al. (U. S. Patent Publication 2002/0007910). Bennett et al. teaches that an adhesive comprising microspheres in an adhesive compound can be coated onto a backing sheet to create a tape (paragraph 0123). It would have been obvious to one of ordinary skill in the art at the time of the invention to coat the adhesive composition of the references as combined onto a tape because Bennett et al. shows that an adhesive composition containing microspheres can be coated onto a backing sheet to create a tape which can be easily applied where desired for bonding substrates together.

Allowable Subject Matter

5. Claims 14, 22-25 and 44-45 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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6. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art suggests dispersing microspheres in an arrangement of micro-wires to form a polygonal arrangement.

Response to Arguments

7. Applicant's arguments, see 1.132 Declaration, filed January 19, 2010, with respect to the rejection(s) of claim(s) 1-5, 8-12, 19, 27-30, 38, 43 under 35 U.S. C. 102(b) as anticipated by Bain et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Meier et al. in view of Aizawa et al. and Bain et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Osele whose telephone number is 571-272-1235. The examiner can normally be reached on M-F 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Mark A Osele/
Primary Examiner, Art Unit 1791
April 26, 2010